# Literacy and the Communication of Safety and Health Information in the Agricultural Home and Workplace:
a bibliography of related resources.

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There is little recent research that directly addresses the impacts of literacy on the health and safety of farmworkers and their families. Many of the organizational and regulatory interventions designed to increase on-farm health and safety are based on the use of written instructional and warning materials such as operating manuals for farm machinery, fertilizer and pesticide use labels and worksite safety posters. Despite the central role that written materials play in farm safety programs, research that examines the effectiveness of these materials is extremely limited. Do these materials effectively communicate essential health and safety information to the diverse population of workers and families who live and work on US farms? With a few important exceptions in the areas of pesticide safety training and the use of graphics to convey on-farm safety information, the literature in agricultural safety does not adequately address this crucial question.

Research that examines related issues of literacy and health / safety communication is generally clustered around the studies of health education, nutrition education, workplace literacy and family literacy. It is focused on issues such as the readability of written health care materials, the impacts of cultural, gender and linguistic diversity on health communication, the connections between low literacy and patient care and alternative ways to develop and communicate health information. While not directly addressing the context of the farm home or worksite, the research findings, educational perspectives and assessment tools described in this literature may have theoretical and practical relevance to the field of agricultural safety. Such generalization is left up to the reader.

This bibliography is not exhaustive. It presents selected findings from a review of recent literature and World Wide Web sites generally related to issues of literacy, health and safety communication in agriculture. It should be viewed as a developing resource. Additions, corrections and comments are strongly encouraged and welcomed. Please contact:

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Impacts of low literacy on safety and health.

Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs, American Medical Association (1999). Health literacy: report of the Council on Scientific Affairs. Journal of the American Medical Association, 281(6), 552-7.

Committee review of 216 published articles and unpublished manuscripts dealing with health literacy. Among the conclusions: 1) patients with inadequate health literacy have a complex array of communications difficulties that may interact to influence health outcome; 2) patients with low health literacy report worse health status and have less understanding about their medical conditions and treatment; 3) preliminary studies indicate that inadequate health literacy may increase the risk of hospitalization.

Baker, D.W., Parker, R.M., William, M.V., Patkin, K., Parikh, N.S., Coates, W. and Imara, M. (1996). The health care experience of patients with low literacy. Archives of Family Medicine, 5(6), 29-34.

Focus group and individual interviews with 60 urban public hospital patients with marginal to poor reading abilities revealed that they have important problems accessing the health care system, understanding recommended treatments and following the instructions of providers. To cope with these problems, patients with low literacy rely heavily on oral explanations, visual cues and demonstrations of tasks to learn new materials. These strategies could be incorporated into health communications.

Bennett, C.L., Ferreira, M.R., Davis, T.C., Kaplan, J., Weinberger, M., Kuzel, T., Seday, M.A. and Sartor, O. (1998). Relations between literacy, race and stage of presentation among low-income patients with prostate cancer. Journal of Clinical Oncology, 16(9), 3101-4.

African American men who participated in this study were more likely to have literacy levels less than Grade 6 and almost twice as likely to present with advanced prostate cancer as white men. When adjusted for differences in literacy, age and city, race was not a significant predictor of advanced stage prostate cancer. Among the conclusions: Low literacy may be an overlooked, but significant barrier to the diagnosis of early-stage prostate cancer among low income white and black men. The development of culturally sensitive, low literacy educational materials may improve patient awareness of prostate cancer and improve the frequency of diagnosis of early-stage cancer.

Gazmarian, J.A., Baker, D.W., Williams, M.V., Parker, R.M., Scott, T.L., Green, D.C., Fehrenbach, S.N., Ren, S. and Koplan, J.P. (1999). Health literacy among

Medicare enrollees in a managed care organization. Journal of the American Medical Association, 281(6), 545-51.

Elderly managed care enrollees may not have the literacy skills necessary to function adequately in the health care environment. Results of this study show that overall 34% of English speaking and 54% of Spanish speaking respondents had marginal or inadequate health literacy. Multivariate analysis showed study location, race/language, age, years of school completed, occupation and cognitive impairment were significantly related to inadequate or marginal literacy. Across groups, reading ability declined dramatically with age.

Kefalides, P.T. (1999). Illiteracy: the silent barrier to health care. Annals of Internal Medicine 130(4), 333-6.

A brief introduction for health care practitioners to the issues surrounding illiteracy and patient care. Estimates that nearly one in three Americans is functionally illiterate and notes that high illiteracy rates are associated with poor health outcomes. Quotes an estimate of the health care costs of illiteracy at $8 to 12 billion. Introduces three literacy screening tests that are used in clinical medicine (i.e., WRAT-R, REALM and TOFHLA). Possible interventions include use of pictographs, and repetition of patient instructions through ìrreturn demonstrationsî,, follow-up phone calls and use of pre- and posttests to make sure patient learning is taking place.

Moon, R.Y., Cheng, T.L., Patel, K.M., Baumhaft, K. and Scheidt, P.C. (1998). Parental literacy level and understanding of medical information. Pediatrics, 102(2), 25.

Examines impact of literacy level on parents' understanding of medical information and ability to follow therapy prescribed for their children. Low scores on the Rapid Estimate of Adult Literacy in Medicine (REALM) test was significantly correlated with young parental age and level of parental education, but did not correlate with the use of preventative services or parental understanding or ability to follow medical instructions for their children.

Raju, K.N. (1997). Maternal and childhood health services and adoption of family planning methods. Indian Journal of Social Work 58(3), 403-417.

Assesses demographic data from National Family Health Survey of India. Among the findings: female literacy was the strongest determining factor whether families sought maternal and child health services.

Ramakka, V.F. (1995). Perceptions of Nevada employers concerning workplace literacy and survey of current workplace literacy programs. Doctoral dissertation. University of Nevada, Reno. (Dissertation Abstracts #AAT9536443).

Describes results from a survey of Nevada employers. Eleven percent reported difficulties in providing worker safety training because of limited worker literacy skills.

Weiss, B.D., Reed, R.L. and Kligman, E.W. (1995). Literacy skills and communication methods of low-income older persons. Patient Education and Counseling. 25(2), 109-119.

Characterizes the literacy skills of older adults living in low-income communities and examines whether those adults have difficulty understanding written health information provided by health care clinicians. Results show that the mean reading skills of subjects was at a Grade 5 level. One-fourth of the subjects reported difficulty in understanding the written materials provided by their health care clinicians.

Weiss, B.D., Blanchard, J.S., McGee, D.L. and Hart, G. (1994). Illiteracy among Medicaid recipients and its relationship to health care costs. Journal of Health Care for the Poor and Underserved. 5(2), 99-111.

Medicaid enrollees participating in this study had a mean reading level of Grade 5.6. No relationship was found between poor reading skills and health care costs though there may be relationships between reading skills and general quality of life indicators that affect health.

Williams, M.V., Parker, R.M., Baker, D.W., Parikh, N.S., Pitkin, K. Coates, W.C. and Nurss, J.R. (1995). Inadequate functional health literacy among patients at two public hospitals. Journal of the American Medical Association. 274(21), 1677-82.

A total of 2659 predominantly indigent and minority (1892 English speaking and 767 Spanish speaking) patients presenting for acute care at two urban, public hospitals were tested for functional health literacy using the TOFHLA. A high proportion of patients were unable to read and understand written basic medical instructions. Of the 2659 patients, 41.6% were unable to comprehend directions for taking medication on an empty stomach, 26% were unable to understand information regarding when a next appointment was scheduled. The prevalence of inadequate or marginal health literacy among the elderly (over 60 years old) was 81% for English speaking patients and 83% for Spanish speaking patients.

2. Effectiveness of health / safety communication.

Keeny, R.L. and von Winterfelt, D. (1986). Improving risk communication. Risk Analysis. 6(4), 417-424.

Suggests strategies to improve effectiveness of risk communication including: 1) increase understanding of lay peoples' individually oriented perception of risk; 2) avoid technical and bureaucratic language and address peoples' concerns directly; 3) increase efforts to educate public about general concepts of risk; 4) use strategies from advertising and marketing to encourage the public to take personal risk reduction measures.

Lee, T.R. (1986). Effective communication of information about chemical hazards. The Science of the Total Environment. 51, 149-183.

Examines modeling of attitude change as induced by printed or verbal communication. Variables influencing the effectiveness of communications are divided into: 1) credibility, power or attractiveness of communication source; 2) the logical, emotional or balanced presentation of the message itself; 3) the modality of message presentation (e.g., spoken vs. written; mass media, etc.).

Leventhal, H., Watts, J.C. and Pagano, F. (1967). Effects of fear and instructions on how to cope with danger. Journal of Personality and Social Psychology. 6(3), 313-321.

Examines a study of behavioral impacts from fear-arousing communications on the dangers of smoking. High-fear communication strengthened desires to stop smoking, but had no effect on actual smoking behavior. The receipt of instructions on how to stop smoking had no effect on desires to stop smoking, but was highly effective in getting subjects to change their smoking behavior.

Teutsch, S.M. (1992). A framework for assessing the effectiveness of disease and injury prevention. Morbidity and Mortality Weekly Report. 41(RR 3), 1-12.

Summarizes two different approaches to prevention: 1) Delivery of prevention technologies; 2) Targeting intervention by stage of disease or injury. Describes an idealized top-down model for developing and implementing prevention strategies and a quantitative approach for assessing the effectiveness of prevention strategies. This approach includes factors such as attributable risk, prevented fraction and cost effectiveness.

Wright, V.V. (1997). Improving workers' right to know: increasing the comprehensibility of material safety data sheets. Doctoral dissertation. Wilmington College. (Dissertation Abstracts #AAT9722222).

Demonstrates that format of presentation affects the effectiveness of hazard communication and that current OSHA required formats for communicating workplace safety hazards are not optimally effective with a work force that has a wide range of education and literacy skills.

Physical, cognitive, cultural readability of health / safety materials.

Guidry, J.J., Fagan, P. and Walker, V. (1998). Cultural sensitivity and readability of breast and prostate printed cancer education materials targeting African Americans. Journal of the National Medical Association. 90(3), 165-169.

The Cancer Prevention Materials and African Americans Project was conducted to assess the cultural sensitivity and readability of printed cancer education materials that target African Americans. Results showed that current materials are not written at appropriate reading levels and only 54% of the breast and 40% of the prostate cancer materials are culturally sensitive.

Holt, G.A., Hollon, J.D., Hughes, S.E. and Coyle, R. (1990). OTC labels: can consumers read and understand them? American Pharmacy 30(11), 51-4.

Readability of 21 over-the-counter drug product labels was measured using the FRY Readability Graph and the FOG Index. According to the FOG Index, labels from 16 selected popular products require at least 7th grade reading levels to comprehend. The FRY Graph added approximately 2 grade levels to that requirement. Physical readability of the labels was also a concern. The majority of the tested labels required a 20/50 visual acuity. The labels were often printed in color contrasts between print and background that made reading difficult.

Lockwood, J.A., Wangberg, J.K., Ferrell, M.A. and Hollon, J.D. (1994). Pesticide labels: proven protection or superficial safety? Journal of the American Optometric Association. 65(1), 18-26.

Through optometric analysis of 54 pesticide labels and a survey of 1623 Wyoming residents, the authors show that the level of physical and environmental safety provided by pesticide labels is seriously limited. Pesticide labels often fail to provide protection by being physically and cognitively inaccessible and by the conscious choice of individuals to neither read not follow label directions. The elements of inaccessibility apparently frustrate people and thereby exacerbate the tendency of individuals to ignore pesticide labels.

Portions of most pesticide labels require at least 20/30 visual acuity. It is estimated that º of the American population does not have the visual acuity to read 15% of pesticide labels. Nearly º of the elderly can not read the majority of general pesticide use labels. The average label requires a cognitive reading ability (i.e., read, interpret, comprehend) at about the 11th grade. It is estimated that no more than 60% and perhaps less than 50% of American adults can understand a
pesticide label.

Assessing cognitive readability of health / safety materials.

Harrison, C. (1980). Readability in the classroom. Cambridge University Press: NY.

Provides a practical guide for assessing the difficulty of books used in school. The emphasis is on the needs of teachers and how they can be met. Describes how to choose appropriate readability formulas, how to properly use the Cloze procedure and how to produce more readable writing.

Klare, G.R. (1974). Assessing readability. Reading Research Quarterly, 10(1), 62-102.

Distinguishes measurement from prediction of readability. Measurement by judgment or tests involves using readers. Prediction is based on the use of readability formulas that count language elements in a piece of writing. This article reviews formulas and related prediction devices. Provides suggestions for choosing an appropriate readability formula. Stresses that formulas provide good indices of difficulty but do not indicate causes of difficulty or provide information on how to write readably.

National Cancer Institute. (1981). Readability testing in cancer communications: methods, examples, resources for improving readability of cancer messages and materials. US National Institute of Health (Publication #81-1689): Washington, DC.

Describes use of SMOG readability test. Provides sample of SMOG test in action along with readability test results for selected health related materials. Briefly reviews other readability tests such as the Cloze test and the Flesch Formula.

Vaughn, J.L. Jr. (1976). Interpreting readability assessments. Journal of Reading 19(8), 635-9.

Compares SMOG, Fry and Dale-Chall readability assessment tools. Points out that readability is a complex concept that can not be definitively described by a single score on any given assessment. All readability scores are merely estimates of the difficulty of a reading passage. They are most useful when taken as indication of a general range of grade level.

Zakaluk, B.L. and Samuels, S.J. (Eds.) (1988). Readability: its past, present and future. International Reading Association: Newark, NJ.

Presents an overview of research on readability. Discusses principles of writing for increased comprehension, determining difficulty levels of text written in languages other than English and new approaches to predicting text comprehensibility.

Workplace literacy demands.

O'NNeil, H.F. Jr. (ed.) (1997). Workforce readiness: competencies and assessment. Erblaum: NJ.

Designed for assessment / evaluation professionals who focus on vocational and technical education. Various authors explore the state of the art in the specification of necessary worker skills and their assessment for students entering the workforce. Both individual and team competencies are explored.

Thomas, D.S. (1993). A workplace literacy audit. Doctoral dissertation. University of Oregon. (Dissertation Abstracts #AAT94052235).

Tests a method for identifying and understanding the literacy demands placed on workers in two sawmills. The research methodology included a three phase needs assessment: conducting employee interviews; developing and field testing a survey of employees for the importance of literacy tasks they perform in their workplace; and performing a statistical analysis of survey returns. Findings show that different employees perceive the literacy demands of the workplace differently. The findings also suggest that employees require functional literacy for dealing with safety and training demands. The literacy audit methodology yielded meaningful, practical findings and appears to have potential to identify and understand literacy demands in other workplaces.

Assessing literacy levels.

Brez, S.M. and Taylor, M. (1997). Assessing literacy for patient teaching: perspectives of adults with low literacy skills. Journal of Advanced Nursing, 25(5), 1040-7.

Examines the responses of English speaking adults with low literacy skills to a screening process that tests their reading abilities in order to facilitate health communication in a hospital setting. Factors that influenced patient response to screening included perceived risks of illiteracy exposure and perceived risks of non-disclosure during hospitalization.

Davis, T.C., Michielutte, R., Askov, E., Williams, M. and Weiss, B. (1998). Practical assessment of adult literacy in healthcare. Health Education and Behavior, 25(5), 613-624.

Reviews the use of literacy assessments, discusses their application in a variety of health care settings and cites issues providers need to consider before testing. Explores formal and informal methods for screening reading and comprehension in English and Spanish including: the Rapid Estimate of Adult Literacy in Medicine; the Wide Range Achievement Test-3; the Cloze procedure; the Test of Functional Health Literacy in Adults.

Hanson-Divers, C.E. (1997). Developing a medical achievement reading test to evaluate patient literacy skills: a preliminary study. Journal of Health Care for the Poor and Underserved, 8(1), 56-69.

Evaluates content and construct validity of the Medical Achievement Reading Test (MART). Concludes that MART is a quick, easy, valid test to estimate patient reading ability.

Nurss, J. (1995). Difficulties in functional health literacy screening in Spanish-speaking adults. Journal of Reading, 38(8), 632-7.

Describes efforts and difficulties encountered by health care professionals who attempted to develop a Spanish language word recognition test as a quick screening for patient literacy levels. The effort was ultimately unsuccessful.

Parker, R.M., Baker, D.W., Williams, M.V. and Nurss, J.R. (1995). The test of functional health literacy in adults: a new instrument for measuring patients' literacy skills. Journal of General Internal Medicine, 10(10), 537-41.

Compares the Test of Functional Health Literacy in Adults (TOFHLA) with the Wide Range Achievement Test-Revised (WRAT-R) and the Rapid Estimate of

Adult Literacy in Medicine (REALM). Both English and Spanish speaking patients were tested. Data suggests that a high proportion of patients can not perform basic reading tasks. The TOFHLA proved to be a valid, reliable indicator of patient ability to read health-related materials.

Wilson, F.L. (1995). Measuring patients' ability to read and comprehend: a first step in patient education. Nursingconnections, 8(4), 17-25.

Examines the discrepancy between patient self report of highest completed school level and actual reading and comprehension levels. Findings indicated that while patients self-reported a mean of 12th. grade completion, WRAT and CLOZE measurements showed the mean patient reading level to be below the 8th. grade. The demographics of people with poor literacy skills suggests that they represent a significant proportion of health care consumers who visit health departments, primary care facilities and community-based health centers.

Individual and cultural context in health / safety communication.

Allshouse, K.D. (1993). Treating patients as individuals. in (Eds.) M. Gerteis, S. Edgman-Levitan, J. Daley and T.L. Delbanco. Through the Patient'ss Eyes. Jossey-Bass: SF.

Stresses the importance of understanding and respecting cultural beliefs and practices in health care communication. Points out that illness often entails an emotional and social context that give it a broader meaning than just physical impairment. Culture--in a broad sense of the word that includes not only ethnicity, but also class, gender and other social attributes--affects how patients understand their illness, how they respond to it, how they communicate about it and how it affects their lives.

Daley, J. (1993). Overcoming the barrier of words. in (Eds.) M. Gerteis, S. Edgman-Levitan, J. Daley and T.L. Delbanco. Through the Patient'ss Eyes. Jossey-Bass: SF.

Lists and briefly describes a series of research-based and anecdotal lessons related to patient-centered communication in a health care setting. Among those lessons: How much information is actually communicated varies with individual differences in age, gender, and cultural background. Patients at risk for ineffective communication include those of different cultural, ethnic and socioeconomic background from their physicians; Patients need time to hear, assimilate and process information they are given; Patients receive information from many different sources and they constantly compare information they receive from one person or source with information from other sources; Patients'

literacy levels, cultural preferences and value systems are not typically explored or understood by health care personnel.

Fessenden-Raden, J. and Fitchen, J.M., Heath, J.S. (1987). Providing risk information in communities: factors influencing what is heard and accepted. Science, Technology and Human Values. 12(3&4), 94-101.

Argues that the message receiver is often overlooked when developing risk communication. Concludes that: 1) reception of information about risk is affected by the complexities of local context; 2) risk messages are filtered through the cultural assumptions and individual knowledge of receivers; 3) messengers have different levels of skill in delivering risk messages; 4) risk communication involves many official and unofficial risk messages that are sometimes in conflict.

Gottesman, R.L., Bennett, R.E., Nathan, R.C. and Kelly, M.S. (1966). Inner-city adults with severe reading difficulties: a closer look. Journal of Learning Disabilities, 29(6), 589-97.

Describes the characteristics of 280 adults, ages 16 to 63, who came to an adult reading program that focused on severe reading difficulties. Suggests that the adults who sought help were generally characterized by a vast array of cognitive, academic and social difficulties. In addition, the extent of those difficulties increased dramatically as literacy levels declined. These findings suggest that comprehensive educational, social and vocational services may be needed to help adults with severe reading difficulties cope with the diverse and severe problems they face.

Lippen, T.M. and Fingeret, H.A. (1992). How adults with limited literacy skills cope with reading medication levels. Literacy South: Durham, NC.

For people with limited literacy skills, compliance with medication regimens is a complex process with a variety of factors at play. The problem does not seem to be illiteracy so much as difficulty in interpreting the cultural assumptions that are embedded in the instructions regardless if these instructions are presented as sample labels or pictograms. Study participants perceived themselves as decision makers who wanted and needed more extensive and more specific information on proper use of medications.

Parikh, N.S., Parker, R.M., Nurss, J.R., Baker, D.W. and Williams, M.V. (1996). Shame and health literacy: the unspoken connection. Patient Education and Counseling. 27(1), 33-39.

Examines the relationship between shame and low functional literacy in health care settings. Patients who presented for acute care at a large public hospital in Atlanta, Georgia completed a demographic survey, the Test of Functional Health Literacy in Adults (TOFHCA) and answered questions about difficulty in reading and shame. Results show that many patients with reading problems are ashamed and hide their inability to read. This shame plays an important role in how low literate patients interact with health care providers.

Safety / health curriculum materials for limited literacy audiences.

Amalgamated Clothing and Textile Workers Union, Chicago Illinois and Northeastern Illinois University and Chicago Teachers Center (1993). Curriculum guide: English as a second language for the workplace, worker education program. (ERIC #ED385177).

Describes a worker-centered, holistic, English language training program for the textile industry in Illinois. The program focuses on limited English proficient adults (primarily Spanish speaking) with an average of six years of formal education. A five unit curriculum covers work issues, health and safety, work forms, quality control and company rules. Students are encouraged to contribute ideas and materials as well. Benefits to encourage participation in this program include partial transportation stipends and on site childcare. A critical part of the program is that workers' individual life and workplace needs become the course of study.

Association of Farmworker Opportunity Programs. (1993). Farmworker nutrition education resource guide. Administration for Children, Youth and Families: Washington, DC. (ERIC #ED357928).

Describes publications and other resources suitable for use in a nutrition related health education program for migrant farmworkers and their families. Materials were selected to serve farmworker populations with low literacy levels. Different languages and subjects covered in the materials. Includes bibliography with 131 references.

Atkinson, R. (1993). Improving listening skills: hazards communication. Office of Vocational and Adult Education: Washington DC. (ERIC #ED374283).

Classroom instructional manual developed as part of the ABCs of Construction, National Workplace Literacy Project. Contains teaching modules for improving listening skills that will increase the effectiveness of a specific commercial training video used in an OSHA safety course. The modules contain a viewing / study guide to help students identify hazard communication words and ideas used in the video.

Auburn University and the Alabama Department of Vocational and Adult Education (1993). A work specific curriculum project: special 353 demonstration project in adult education. (ERIC #ED361574).

Provides samples of work specific curricula for basic and advanced levels of the safety section for an Auburn University demonstration project in adult education. The samples consist of instructor manuals and student books. Content of each instructor's manual includes readability tests, three lessons matched with competency skills, workplace materials that were used to develop the books and materials on learning methods. The student book contains samples of curriculum materials for three lessons on safety and housekeeping, machine adjustments and machine safety.

Bond, J. and McGill, T. (1994). Paperwork plus: literacy materials for the service industry. Etobicoke Board of Education: Ontario. (ERIC #ED407877).

Instructional materials intended for use in teaching vocational English and English literacy to limited English speaking workers in the hotel industry. Thirteen instructional units are designed for learners at three instructional levels and address job specific literacy tasks. Among the topics covered: health and safety signs and labeling; scheduling; housekeeping.

Career Resources Development Center (1993). Project EXCEL: Holiday Inn at Union Square, Housekeeping Department safety and security, unit 2. Career Resources Development Center, Inc: SF. (ERIC #ED373600).

Presents a curriculum intended for limited English proficient workers (predominately Chinese speaking) in the housekeeping unity of a San Francisco hotel. An introductory section gives an overview of the curriculum and offers suggestions for classroom presentation. The curriculum consists of six instructional units covering topics such as: parts of the body: water, fumes and falls; fire and shock; safety signs; and reporting accidents. Each unit contains worksheets and written exercises.

Downie, D. (1994). Safe Use Project Thailand: a report on the success of Phase I. Pesticide Outlook 5(4), 13-7.

Describes the first phase of an industry-sponsored pilot program developed to promote the safe use of chemicals in poor societies with low literacy. The success of Phase I in Thailand is discussed.

Grandjean, A. and Bernett, C.S. (1990). Eat less food. Indian Health Service Diabetes Program: Albuquerque, NM.

One of a series of nutrition booklets developed for American Indian adult diabetics with low literacy skills.

Hudson River Center for Program Development. (1994). First aid: helping yourself, helping others. Health promotion for adult literacy: an empowering approach. New York State Department of Education, Albany. (ERIC #ED368951).

Provides a program to help adult literacy students learn about first aid. Topics include first aid for adults, children and infants.

Keresztes-Nagy, S. (1993). Health and safety in the workplace. Worker Education Program. Curriculum Guide. US Dept. of Education, Washington, DC (ERIC #ED379957).

Provides a curriculum on occupational safety and health designed for workplace literacy and basic skills programs sponsored by the Clothing and Textile Workers Union. Its objectives are to help workers understand the importance of following company health and safety rules and danger signs, identify and report workplace hazards, recognize symptoms of common workplace illnesses and understand the importance of overall health and fitness. The guide includes charts of common health and safety hazards and instructional materials drawn from a problem-based workplace ESL text.

Lao Family Community of Minnesota and Northwest Educational Cooperative (1988). ESL workplace literacy curriculum for a JTPA family English demonstration project. Lao Family Community of Minnesota, Inc.

Presents a curriculum developed to provide workplace literacy instruction to Hmong refugees with limited English proficiency. Briefly describes process of curriculum development and curriculum content. Provides 17 instructional units that include teaching suggestions. One unit is focused on workplace safety.

Mason, A. and Burgess, W. (1995). Meeting the food safety needs of bilingual and low literacy youth. Purdue University Cooperative Extension Service.

Videocassettes, audio cassettes and lesson books in both Spanish and English that help children learn about bacteria and other issues of food safety.

Merlin, S.B. (1996). Workplace literacy: developing and implementing an ESL curriculum for limited English proficient poultry workers. 40th Meeting of the College Reading Association, Charleston, SC. (ERIC #ED409750).

Describes the development and implementation of an ESL program for limited English-proficient employees of the poultry industry. The curriculum focuses on job-specific workplace communication needs based on data gathered from supervisors, human resource managers and employees in the poultry industry. Assessment tools and curriculum units were organized into three levels: basic (no English), limited English and functional. Unit topics include safety, tools and machines, poultry-related vocabulary and completing forms.

National Center for Farmworker Health (1996). Bilingual Patient Education Materials. (Publication #5386). National Center for Farmworker Health, Inc.: Austin, TX.

Portfolio of low literacy, bilingual materials developed as patient education tools to help health care practitioners provide easy, low-cost health education to low literacy patients who speak English or Spanish. Among the covered topics: rules for healthy eating; work injuries; skin emergencies. Units can be downloaded at no charge from the NCFH web page.

Seattle-King County Private Industry Council (1992). Workplace literacy development guide for employers. US Department of Education: Washington DC.

This guide was developed to assist employers implement a company sponsored on-site workplace literacy program for their employees. Topics covered include literacy needs assessment, marketing workplace literacy within the company, analysis of literacy skills needed within the company and developing instructional strategies.

Silc, K. and Outterson, B. (1997). ESL for farm safety. Student workbook and teachers manual. US Environmental Protection Agency. Washington, DC. (ERIC #406862).

Presents ESL instructional materials intended for limited English proficient farmworkers. Provides information on the safe use of pesticides and pesticide related illness on the job. The seven lessons are designed to teach English as a second language learners vocabulary and communication skills related to themselves, their farm occupations, the nature of pesticides, usage and warning labels, health risks and symptoms of illness. The student workbook contains

lessons and exercises. The teacher'ss manual contains suggested classroom techniques and procedures keyed to the student workbooks, a list of National Worker Protection offices with addresses, and a list of Farmworker Opportunity Programs' AmeriCorps Pesticide Safety Coordinating offices.

UNESCO (1996). Are you safe from chemical pesticides? Asian Cultural Center for UNESCO: Tokyo.

An information pack of 10 illustration boards and an audio cassette designed for low literate farmers at elementary and middle literacy levels in the Asian/Pacific region. The cassette contains a 10 minute discussion between a peasant, his wife and his knowledgeable uncle on the danger of chemical pesticides. The boards illustrate safety measures to be taken when applying and storing pesticides, how to deal with pesticide poisoning and how to control pests without using pesticides.

University of California Cooperative Extension--Tulare County (1985). Guia de seguridad las personas que trabajan con pesticides. UC Cooperative Extension: Tulare.

Using illustrations with captions written in Spanish, this guide is designed to help low literacy workers learn pesticide safety information.

US CSA/ Office of Community Services and the Association of Farmworker Opportunity Programs (1993). Farmworker nutrition education resource guide, May 1993. Association of Farmworker Opportunity Programs: Arlington, VA.

Lists and surveys available nutrition education resources suitable for farmworker communities. Materials are targeted for hard to serve farmworker populations--people with low literacy levels, limited knowledge of English, who are economically disadvantaged and predominantly performing agricultural work. Contains culturally specific nutrition education materials on varied topics in languages other than English. Aimed at farmworker service providers who serve migrant and seasonal farmworkers.

Whu, L.F. and Zhang, A.L. (1995). From classroom to computer screen: NWLP software: a set of computerized garment-related bilingual (English and Chinese) literacy lessons. Office of Vocational Education: Washington, DC. (ERIC #ED388116).

Describes how a National Workplace Literacy Program was developed for Chinese garment workers in New York City. Because there are limited garment-

related teaching materials designed for teaching second-language speakers, the program had to adopt, tailor and create teaching materials to meet the needs of the target population. Lesson plans include: safety and work signs; measurement and size; job titles and others.

Zavala, M., Weber, J. and Marer, P. J. (1996). Fieldworkers and pesticides: a trainer's manual. University of California Statewide Pest Management Project. Division of Agriculture and Natural Resources: Oakland, CA.

Provides guidance to instructors who train agricultural fieldworkers. Focuses on effective ways to communicate specific points that are included in the US EPA-required Worker Protection Standard training. A variety of training techniques are described. Many are appropriate for workers with low literacy skills. Useful health and safety illustrations are included.

10. Alternative approaches to health / safety communication.

Bill-Harvey, D., Rippey, R.A., Abeles, M. and Donald, M. (1989). Outcome of an osteoarthritis education program for low-literacy patients taught by indigenous instructors. Patient Education and Counseling 13(2), 133-142.

Examines the impacts of a 10-hour educational course in which indigenous community leaders were used as teachers to provide information on osteoarthritis to older adults in inner city neighborhoods of Hartford Connecticut. Findings show that use of indigenous teachers was effective in changing health behaviors and attitudes of those who participated.

Center for Health Promotion and Education and the American Hospital Association (1982). Culture-bound and sensory barriers to communication with patients: strategies and resources for health education. Center for Health Promotion and Education: Atlanta, GA.

Teaching strategies designed for use by health educators with the aim of improving delivery of health education for various cultural groups. Problems experienced with education of low literacy, hearing or sight impaired persons are addressed. Discussion of effective means of communication with these groups is included. Also includes a list of bibliographic and organizational resources.

Doak, C.C., Doak, L.G. and Root, J.H. (1985). Teaching patients with low literacy skills. Lippincott: Philadelphia.

Presents a detailed, practical handbook that provides theoretical background, basic information and guidelines to help health professionals in planning health teaching strategies for patients who have poor reading comprehension skills. The ten chapters cover issues such as: the magnitude, nature, health impacts and myths of illiteracy concerning patients; techniques for testing patient comprehension; methods for testing the readability of written materials; how to write for adults with low literacy skills; the use of audio cassettes and visual aids as learning tools; the causes, characteristics and teaching management of learning disabilities including dyslexia. Numerous illustrations and strategies are included throughout the text.

Dyck, S.V., Bettell, E. Isserlis, J. and Nonesuch, K. (1996). Women and work in (Ed.) K. Nonesuch. Making connections: literacy and EAL curriculum from a feminist perspective. Canadian Congress for Learning Opportunities for Women: Toronto.

Presents literacy exercises that challenge some widely held beliefs about women and work. Exercises include guided imagery of potential jobs, graphing of men's and women's earnings and guided discussion on barriers to women's employment.

Hartman, T.J., McCarthy, P.R., Park, R.J., Schuster, E. and Kushi, L.H. (1994). Focus group responses of potential participants in a nutrition education program for individuals with limited literacy skills. Journal of the American Dietitian Association 94(7), 744-8.

Participants in a food and nutrition education program were interviewed in focus groups to obtain information to direct the design and development of a nutrition intervention program targeted at a low literacy audience. The focus groups included 23 African Americans, 9 whites, 4 Southeast Asians, 1 American Indian, 2 Hispanic Americans and 2 Middle Eastern nutrition program participants. Participants helped identify several barriers to making changes in eating habits. They also shared their ideas for program content and delivery. The authors note that clients with limited literacy skills have valuable opinions and insights that program developers targeting this hard to reach group should hear. The participants wanted simple, practical and relevant information about what foods to eat and how to prepare them. They considered lectures to be an ineffective way to receive nutrition information and they expressed a preference for hands-on activities that were enjoyable and allowed participants to share ideas and experiences.

Macario, E., Emmons, K.M., Sorensen, G., Hunt, M.K. and Rudd, R.E. (1998). Factors influencing nutrition education for patients with low literacy skills. Journal of the American Dietetic Association, 98(5), 559-64.

Interviews with literacy experts, health care providers and adult basic education students suggest that effective nutrition interventions must build on patients' social networks, appear in a visually based, interactive format and be culturally appropriate.

Rudd, R.E. and Comings, J.P. (1994). Learner developed materials: an empowering products. Health Education Quarterly. 21(3), 313-327.

Describes the use of Freire's problem-posing educational methods in four case studies (one literacy, three health care) in which community participants were involved in the development and production of learning materials.

Serle, O. (1966). Writing for safety: facilitating a team approach to writing operating instructions. ANTA Leading Edge Case Study Project Report: Workplace Skills Unit. Swineborne University of Technology, Australia. (ERIC #ED410405).

Describes a project in which all production employees participated in the process of writing operating instructions for a manufacturing operation. The implementation strategy included briefing production employees, forming writing groups, and conducting workshops on the team approach. Results show that the process significantly changed worker attitudes towards safety and teamwork in the company.

Skinner, C.S., Strecher, V.J. and Hospers, H. (1994). Physicians' recommendations for mammography: do tailored messages make a difference? American Journal of Public Health 84(1), 43-9.

Message tailoring, based on individual needs and circumstances, is commonly used to enhance face to face patient counseling. Only recently has individual tailoring become feasible for printed messages. Subjects in this study (x=435) were randomly allocated to receive individually tailored or standardized mammography recommendation letters mailed from physicians to patients' homes. Follow-up interviews were conducted eight months later. Tailored letter recipients were more likely to remember and have read more of their letters than standardized version recipients. After controlling for baseline status, tailored letter receipt was associated with more favorable follow-up mammography status for women with incomes below $26,000 and for Black women.

Waterson, A. (1994). Interpreting audiences: cultural anthropology in market research. Practicing Anthropology. 16(2).

Traditional market survey techniques often generalize minority audiences. Anthropological research techniques can help to more accurately define minority audience segments in order to more effectively tailor information presentation to specific population segments.

11. Pictures and pictographs in health / safety communication.

Bradley, S.M. (1995). How people use pictures: an annotated bibliography and review for development workers. International Institute for Environment and Development and the British Council. London.

Provides an annotated bibliography on the ways people understand pictures across diverse cultures, languages and levels of literacy. Emphasis is on development education.

Cairney, S. and Sless, D. (1982). Communication effectiveness of symbolic safety signs with different user groups. Applied Ergonomics, 13(2), 91-97.

Examines results from a study of recognition and recall of occupational safety signs among a group of Vietnamese migrants and native-born Australians attending adult literacy classes. Despite intergroup differences in the total number of signs correctly identified, the same signs gave rise to difficulties for all groups. The most confusion was generated by the symbols for "radiation hazard" and by the colors for warning (yellow and black).

Friedmann, K. (1988). The effect of adding symbols to written warning labels on user behavior and recall. Human Factors, 30(4), 507-15.

Describes a study on the use of consumer products by 144 undergraduates to determine the effects that (a) adding symbols to written warnings, (b) Subjects' familiarity with the product and, (c) type of hazard have on their noticing, recalling or complying with the warning. Across all behavioral measures there was a steady decline in the number of Subjects who first noticed (88%), then read (46%) and finally followed the warning (27%). Symbols added to written warnings did not significantly increase levels of compliance. A positive relationship was

found between the perceived hazardousness of the product and reading, following and recalling the warning.

Grieshop, J.I., Stiles, M.C. and Domingo, I.V. (1995). Drawing on experience: Mexican-origin workers' evaluation of farm safety illustrations. Journal of Agricultural Safety and Health, 1(2), 117-133.

Assesses the effectiveness of illustrations used in printed farm safety materials. Two culturally diverse groups of farmworkers originally from Mexico were interviewed to measure their ability to interpret frequently used safety illustrations. Frequency of use of mass media and exposure to farm safety trainings were found to significantly influence respondents' level of understanding. Data suggest that care is warranted when creating visual messages for culturally diverse groups. To ensure effectiveness of images it is essential to assess the target audiences' understanding and to utilize visual conventions common to them.

Grieshop, J.I. and Winter, D. (1988). Communication for safety's sake: visual communication materials for pesticide users in Latin America. Tropical Pest Management, 34(3), 249-262.

Field testing of pictographs, pictures and symbols depicting proper and improper procedures for using agricultural pesticides show that the meaning of visual symbols must be taught to pesticide users if the goal is perfect comprehensibility of safety materials.

Gore, P.H. and Sleight, T. (1982). Pesticides and peasants: they don't mix. The Rural Sociologist, 3, 98-101.

Agricultural chemical packages should be clearly labeled with pictures in a universally understandable labeling system that show the dangers involved in handling chemicals and the precautions that should be taken when using them.

Mayer, D.L. and Laux, L.F. (1989). Recognizing the effectiveness of warning symbols and pictorials. Proceedings of the Human Factors Society--33rd. Meeting.

Examines the effectiveness of graphics in communicating safety information. Generally, pictorials that depicted simple, clearly identifiable hazards or protective equipment were more identifiable than symbols. There were clear differences between males and females and between different age groups in how

safety pictorials and symbols were interpreted. Among the conclusions: there are no universally effective graphics.

Moriyama, M., Harnish, D.L. and Matsubara, S. (1994). The development of graphic symbols for medical symptoms to facilitate communication between health care providers and receivers. Thoku Journal of Experimental Medicine, 174(4), 387-98.

Describes the development and testing of 26 graphic symbols designed to represent basic health symptoms. Testing found the symbols to be effective alternatives to verbal communication.

Paskett, E.D., Tatum, C., Wilson, A., Dignan, M. and Velez, R. (1996). Use of a photoessay to teach low-income African American women about mammography. Journal of Cancer Education, 11(4), 216-20.

A photoessay depicting the process of getting a mammogram was developed and used in community outreach for the Forsyth County Cancer Screening Project. Results from a follow-up evaluation survey showed that overall, women liked the photoessay and felt that it provided knowledge and reduced fears about mammography. Strategies such as this may be ideal to communicate important information about cancer prevention and control in low literacy populations.

Sloan, G. and Eshelman, P. (1981). The development and evaluation of pictographic symbols for conveying product misuse information. Department of Design and Environmental Analysis, Cornell University, NY.

Describes a method for generating and evaluating safety symbols that bring together the designer, researcher and product user in order to maximize the likelihood that an effective symbol will be generated.

12. Policy and program intervention.

California Workforce Literacy Task Force (1990). California's workforce for the year 2000: improving productivity by expanding opportunities for the education and training of underserved youth and adults. Joint Publications: Sacramento, CA.

Underscores that unmet literacy needs limit the productivity of California's workforce. Among the taskforce policy recommendations: establish employer incentives to increase workplace education and learning; establish a system of basic skills training for public sector workers; increase the use of technology in

literacy training; increase the priority of parent literacy training in education spending; establish field stations throughout the state for action research and evaluation focused on workforce skills and training.

Hollenbeck, K. (1993). Classrooms in the workplace: workplace literacy programs in small and medium-sized firms. Upjohn Institute: Kalamazoo, Michigan.

Case study and survey data are used to present a systematic assessment of workplace literacy programs. Among the topics addressed: the extent of basic skills deficiencies; reasons for offering and not offering workplace literacy programs; characteristics of firms with workplace literacy programs; impacts of workplace literacy programs; policy recommendations.

Marcias, R.F. (1988). Latino illiteracy in the United States. Tomas Rivera Center: Claremont, CA.

Describes a study of Latino literacy in the US including a secondary analysis of census and survey data. Finds that Latinos are often overlooked in literacy research, policy and services within the US. Provides a statistical profile of Latino literacy. Also provides a large selected bibliography on Latino literacy and literacy and second language acquisition.

Nurss, J. (1988). Adult literacy and health care. in C. Smith (Ed.) Literacy for the twenty-first century: Research, policy, practices and the National Adult Literacy Survey. Praeger: Connecticut.

Provides and overview of the literature on adult literacy and health care. Defines functional health literacy as the adequacy of the adult's literacy to read and comprehend materials encountered in typical health care settings and necessary to positive health outcomes. Critiques various tests for adult literacy and their practical value in assessing functional health literacy. Describes the prevalence of low function health literacy in adults and discusses proposed modifications of health care provision that might help patients with low functional health literacy. Among the solutions discussed: make written health care materials more reader friendly with culturally appropriate graphics and illustrations; help health care providers become more aware and sensitive to low literacy patients; use audio or video tapes; make materials more culturally sensitive and more culturally relevant.

Plimpton, S. and Root, J. (1994). Materials and strategies that work in low literacy health communication. Public Health Reports, 109(1), 86-92.

Describes a Maine Area Health Education Center program to address the problem of health education materials that can not be read or comprehended by low literacy adults. Professions in health education and adult education were trained to produce easy-to-read health materials. Concurrently, a model for teaching oral communication skills to health care providers who deal with low literacy adults was developed. A process of training--the trainers help spread these communication skills.

13. Selected web resources.

Diversity Rx (http://www.diversityrx.org). Sponsored by the National Conference of State Legislatures, Resources for Cross Cultural Health and the Henry J. Kaiser Foundation,

Diversity Rx is dedicated to promoting language and cultural competence to improve the quality of health care for minority, immigrant and ethnically diverse communities. The web site is organized into five different sections: Essentials (basic facts on language, culture and health care); Models and Practices (descriptions of service delivery programs, training, curricula, standards of practice that are currently in use); Policy (regulations, laws, organizational policies); Legal issues; Networking (resources, web site links-- coming soon: resources and bibliographies). A jewel of a website.

ERIC Clearinghouse on Adult, Career and Vocational Education (http://ericacve.org).

Provides free, full range public access into the vast ERIC education database through an easy-to-use search engine. Allows on-line ordering of ERIC reprints. Offers links to related sites in the areas of adult literacy, vocational education, employment and training. Included are links to the US Departments of Labor, Education and Labor Statistics.

National Center for Adult Literacy (http://literacy.upenn.edu).

Access to policy, research and training publications developed through the National Center for Adult Literacy and the International Literacy Institute of the University of Pennsylvania. Provides links to national and international literacy web sites.

National Center for Farmworker Health, Inc. (http://www.ncfh.org).

Provides a descriptive introduction to the issues confronting farmworkers in the US. The NCFH resource catalog includes migrant health center directories, bilingual patient education materials and a nice collection of commemorative artwork! All resource materials can be ordered through the website. A section on links to other organizations and resources provides web connection to a number of organizations dealing with farmworker advocacy, education, health, occupational health and housing.

National Clearinghouse for ESL Literacy Education (http://www.cal.org/ncle).

Gateway to a wealth of resources that address the general issues of ESL literacy education. Direct connection to ERIC Digest articles on topics such as: ESL policy issues; ESL methods and approaches (what works!); workplace and vocational ESL; and program design. Provides a short list of FAQs on ESL. Ordering information NCLE books and other publications including free annotated bibliographies and priced program videos.

National Institute for Literacy (http://novel.nifl.gov).

"One stop shopping" for literacy information. Offers three different search programs allowing searches of national, regional and state literacy web sites; access to detailed descriptions and summaries of resources catalogued by local, state, national and international literacy organizations as well as resources in the databases of the Library of Congress, ERIC and Canada (note: this data base search program was down for repairs at the time of this writing); and searches across archives of various on-line literacy discussion groups. Provides up-to-date information on NIFL publications and events. Provides connection to on-line discussion groups on family literacy, workplace literacy, health literacy and others. Provides literacy fast facts on family literacy, literacy and health, workplace literacy, literacy and learning disabilities and others. This web site offers a mother lode of literacy information and resources.

National Literacy and Health Program of the Canadian Public Health Association
http://www.nald.ca/nlhp.htm

NLHP promotes awareness among health professionals of the links between literacy and health. This website is organized into eight sections: the National Literacy and Health Program; Research; Newsletter; Links; Partners; Program Resources to Order; the Plain Language Service. Includes descriptions of the benefits and resistance to the use of Plain Language in health information. The research section provides a bibliography of health information materials written in Plain Language and a substantial bibliography of research connecting literacy to

health. The emphasis through much of the web site is on the use of Plain Language in health communication.

Patient Education for the University of Utah Health Sciences Center (http://www.med.utah.edu/pated/authors)

Presents an Author's Guide for Patient Education Written Materials. Sixteen different sections cover topics such as: effective patient teaching; clear writing; literacy facts; readability testing; substitute word list; copyright information; support resources. A concise, practical guide for creating user friendly patient education materials.

Bibliography Addendum - Stiles - Injury Prevention Education Program

Alcalay, Rina and Bell, Robert (1996). Ethnicity and health knowledge gaps. Impact of the California Wellness guide on poor African American, Hispanic, and non-Hispanic white women. Health Communication, 8(4), 303-329.

The study examined the impact on poor African American, Hispanic, and non Hispanic White women of a health promotion intervention sponsored by The California Wellness Foundation. They develop a booklet containing health information at each stage of life. The booklet is called the guide (La Guía in Spanish). Low income Hispanic, Afro American and non-Hispanic women have a substantial gap in wellbeing-related knowledge and information acquisition skills, with seldom differences from each other. In contrast with African American and non-Hispanic White, Hispanic have lower levels of knowledge, have less confidence in the knowledge that they posses, and are unsure how to get additional information on topics addressed in La Guía.

Bell, Robert and Alcalay, Rina (1997). The impact of the Wellness Guide/Guía on Hispanic women's well-being-related knowledge, efficacy beliefs, and behaviors: The mediating role of acculturation. Health education and behavior v.24 (3), pg. 326-343

Levels of acculturation have an impact on knowledge, efficacy beliefs, and behaviors of Hispanic women. Low acculturated mothers have less assistance - seeking efficacy, and less confidence in their abilities to acquire more wellness-related information. Plus, there is a gap between acculturated women and less acculturated, however the Guía did not increase the knowledge gap between high and low acculturated guide users, even though both use the Guía. Acculturation was measure on language use en general and language preference in particular.

Marin, Gerardo, (1994). Self reported awareness of the presence of product warming message and signs by Hispanics in San Francisco. Public Health Reports v.10, pg. 275-284.

Less acculturated, Spanish-speaking Hispanics are less likely to report being aware of the warnings, particularly those that appear only in English (for example, alcohol beverage). However, warning message on cigarette packets was reported have seen within 12 months before the survey. The study was carried out in 1990 and 1991. The messages selected were cigarettes, alcoholic beverage and other consumer products, and were randomly tested in 1,204 Hispanic (43.5 percentage males).

MarÌnn, Barbara V, Tschann, Jeanne M. and GÛmmez, Cynthia A. (December, 1993). Acculturation and Gender Differences in Sexual Attitudes and behavior: Hispanic vs. non-Hispanic White unmarried adults. American Journal of Public Health v. 83, n∫ 12, pg. 1759-1761.

Hispanic women have less partners than non-Hispanics White men and woman, and consider themselves at low risk. However, Spanish Hispanic men and English-speaking men reported to have multiple partners. Thus Hispanic woman can be seen as both more protected and more at risk. Plus Spanish speaking women reported the lowest rates of condom use and are less knowledgeable about HIV.

Stable, Eliseo J., MarÌnn, Gerardo, and MarÌnn, Barbara V., (1994). Behavioral risk: a comparison of latinos and non-Latinos White in San Francisco. American Journal of Public Health. v.84, n∫6

Behavioral risk factors profiles by ethnicity help emphasize priorities of health promotion programs for a community. Latino men and women have consumed less alcohol beverage in previous month (59%ans 29% vs. 77% and 75%), and they are more sedentary than non-Latinos White (40% and 46% vs. 17% 23%). Latina women smoke less cigarettes (8% vs. 29%) than its counterparts, however, Latina women reported have ever had Pap smear (76% vs. 93%) and to have had a clinical breast examination (81% vs. 96%).